

## SCIENTIFIC NOTE

**Flight activity of *Agriotes lineatus* L. and *A. obscurus* L.  
(Coleoptera: Elateridae) in the field.****STEVE CROZIER, ANDREA TANAKA and ROBERT S. VERNON****PACIFIC AGRI-FOOD RESEARCH CENTRE,  
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The dusky wireworm, *Agriotes obscurus* L., and the lined click beetle, *A. lineatus* L. (Coleoptera: Elateridae) were introduced to British Columbia (BC) from Europe around 1900 (Wilkinson *et al.* 1976). Their initial discoveries in BC (King 1950; King *et al.* 1952) and the Maritime provinces (Eidt 1953) were of particular importance at that time, since both species were considered among Europe's most destructive insects (Eidt 1953). In recent years, these species have become major pests of small fruit, vegetable, ornamental and forage crops throughout the Fraser Valley of BC (Vernon *et al.* 2001).

Since their discovery in Canada, it has been stated that *A. lineatus* and *A. obscurus* populations do not fly (Eidt 1953; Wilkinson *et al.* 1976), although flight activity in both species has been reported from Europe (Brian 1947). Whether these species actually fly in Canada is of importance, since the efficacy of various alternative control methods under consideration (e.g. mass trapping, mating disruption and physical exclusion) would likely be affected by flight activity. This note describes a number of independent observations made by the authors under field conditions in the lower Fraser Valley of BC in 2001 and 2002, which verify that flight activity occurs in both *A. lineatus* and *A. obscurus*.

**Agassiz, 2001:** In a 1 ha fallowed field in Agassiz, BC, a Vernon beetle trap (PheroTech Inc., Delta, B.C. V4G 1E9) baited with *A. obscurus* pheromone (Vernon *et al.* 2001) was inspected at 1530 on 22 May, 2001. The temperature at that time was 28 °C under sunny skies with only a slight breeze. The contents of the trap, which consisted of 85 male *A. obscurus*, were emptied into an open metal pan for sorting. Although most of the beetles were dead, a number were still quite active and one beetle climbed onto a film vial in the pan and took flight. It flew about 3 m to the east, then turned and gained altitude from 1 m to 2 m and flew west, at one point flying about 2.5 m high. The beetle flew for about 30 m at which point it was caught in mid air about 2 m above ground and saved for identification. The specimen was confirmed as a male *A. obscurus* (by R. Vernon).

**Ladner, 2002:** Several click beetles were observed in flight between 1230 and 1530 on 12 May, 2002 in a 1 ha field of pasture surrounded by larger fallow fields in Ladner, BC. The temperature was 24 °C at 1200 under sunny skies with westerly winds at 13 km/h and a relative humidity of 64%. The field directly west of the pasture was in the process of being cultivated, and at least 20 click beetles appeared to be flying toward the pasture from that direction. A number of the click beetles in flight were captured and tentatively identified in the field as a mixture of *A. lineatus* and *A. obscurus*.

When the thick grass of the pasture was also inspected, large numbers of *A. lineatus* and the occasional *A. obscurus* (about 5 to 10 beetles/m<sup>2</sup>) were observed crawling up the blades of grass, raising their elytra and taking flight. Out of 20 beetles captured in flight by hand, every one was capable of escaping from the captor's open hand via flight. Flights were best described as direct and deliberate with little to no side-to-side movements. Beetles gained altitudes up to 4 m with the majority flying between 1 and 2 m in height. The beetles appeared to be relatively strong fliers, travelling at the speed of a

brisk jog or approximately 5 to 10 km/h. Distance covered while flying ranged from less than 1 m to 100 m on one occasion, with an average flight covering a distance of 2 to 3 m. Twelve beetles were intercepted mid-flight on clothing while traversing the pasture. The captured specimens were confirmed (by R. Vernon) as *A. lineatus* males (6) and females (2) and *A. obscurus* males (4).

Flight behaviour was again observed in the field of pasture between 1430 and 1700 on 24 May, 2002. Temperatures ranged from 16-17 °C during this period under scattered cloud with westerly winds at 7 km/h and relative humidity between 56% and 46%. Flight activity was not as prevalent as on 12 May, with only eight beetles being observed in flight. Most flights appeared to occur in random directions within the pasture, with no beetles being observed to enter into or exit from the surrounding fallow fields. Six beetles were captured in flight and positively identified (by R. Vernon) as male *A. lineatus* (5) and male *A. obscurus* (1).

**Surrey, 2002:** Both male and female *A. obscurus* and *A. lineatus* were observed in flight between 1300 and 1700 on 12 May, 2002 at a suburban residence in South Surrey, British Columbia. The flight activity coincided with the first warm day of the beetle emergence period (R.S. Vernon, unpublished data), at a temperature of approximately 26 °C under sunny skies. Beetles were observed climbing blades of grass on a recently cut lawn. Successful flight from the grass usually took several attempts and short flights in the range of 10 cm were common. With longer flights, beetles rose at a constant velocity up and out of the yard at altitudes of 1 to 4 m. A single male *A. lineatus* successfully took off from the lawn, gained an altitude of about 1 m, descended towards a deciduous shrub and circled a horizontal branch before landing on the upper side. Closer inspection revealed the presence of an *A. lineatus* female 5 cm away. At 1600, an average density of four click beetles/0.09 m<sup>2</sup> of lawn was recorded. Active beetles were found in the house all that day, but had not been seen the previous day. By around 1700, flight activity had mostly ceased. Beetles were searched for daily throughout the rest of the summer, but were never observed in a mass flight again. Of 20 beetles captured in flight, 6 male and 5 female *A. lineatus* and 4 male and 5 female *A. obscurus* were positively identified in the lab (R. Vernon). Females frozen and dissected later were found to contain eggs in good condition.

## REFERENCES

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